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Research Notes : Linkage tests between the Ap and W1 loci

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1) Linkage tests between the *Ap* and W_1 loci.

The F_2 generation of the cross 'Williams' x 'Manchu (Madison)' was used to determine if the *Ap* and W_1 loci were linked. The *Ap* locus controls a seed acid phosphatase which exists in the germplasm in three different electrophoretic forms controlled by three codominant alleles--Ap^a, Ap^b, and Ap^c (Hildebrand *et al.*, 1980). The W_1 locus controls flower color--purple (W_1) and white (w_1).

The W_1 genotype of F_2 individuals was determined by observing hypocotyl color of germinating seeds. Plants with purple hypocotyls have purple flowers. The *Ap* genotype was determined by electrophoresis (Hildebrand *et al.*, 1980).

The results of the linkage study are presented in Table 1. In the table a = $Ap^bAp^bW_1$, b = $Ap^bAp^cW_1$, c = $Ap^cAp^cW_1$, d = $Ap^bAp^bw_1w_1$, e = $Ap^bAp^cw_1w_1$, and f = $Ap^cAp^cw_1w_1$. The chi-square test for independent assortment was used to determine whether linkage was present. The chi-square test for independence was 1.64 with 2 degrees of freedom, indicating that the *Ap* locus is inherited independently of the W_1 locus.

Table 1

F_2 linkage test of *Ap* and W_1 loci, from the cross Williams ($Ap^bAp^bw_1w_1$) x Manchu (Madison) ($Ap^cAp^cW_1W_1$)

a	b	c	d	e	f	Sum	% R
21	44	28	11	22	8	134	I

Reference

Hildebrand, D. F., J. H. Orf and T. Hymowitz. 1980. Inheritance of an acid phosphatase and its linkage with the Kunitz trypsin inhibitor in seed protein of soybeans. Crop Sci. 20 (in press).

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